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Citation	PUBLICATIONS OF THE SETO MARINE BIOLOGICAL LABORATORY (1993), 36(1-2): 85-87
Issue Date	1993-03-30
URL	<a href="http://hdl.handle.net/2433/176220">http://hdl.handle.net/2433/176220</a>
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Type	Departmental Bulletin Paper
Textversion	publisher

**Resting Stage and Newly Hatched Hydroid of a Cool Water  
Hydrozoan Species *Climacocodon ikarii* Uchida  
(Hydrozoa, Margelopsidae)**

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*With Text-figure 1*

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**Abstract** A resting stage was found in a cool water hydrozoan, *Climacocodon ikarii*, the development of which had been thought to be tachygenetic. The resting stage in the form of a cyst, and the newly hatched hydroid, are described.

**Key words:** resting stage, cyst, newly hatched hydroid, cool water hydrozoan, *Climacocodon ikarii*

### Introduction

Among the anthomedusae, *Climacocodon ikarii* Uchida, 1924 is unique in having a pelagic, solitary hydroid (Uchida, 1924). The life cycle of this species was clarified by laboratory-rearing (Kubota, 1979) and the tachygenesis pointed out by Uchida (1924) was demonstrated, i.e. an actinula-like hydroid develops directly on the manubrium of the female medusa and the liberated hydroid soon produces medusa buds. However, a resting stage was discovered by culture of this species collected from two localities in northern Japan and the primary hydroid was obtained after a period of dormancy in the form of a cyst. The resting cyst and newly hatched hydroid stages are described and the life cycle of the cool water hydrozoan *Climacocodon ikarii* is illustrated in this paper.

### Materials and Methods

Mature female and male medusae were collected in Hokkaido, northern Japan, from Oshoro in late January, 1988, and from Muroran in early May, 1988. They were reared in small polystyrene vessels (60 mm wide and 30 mm deep or 80 mm wide and 40 mm deep) filled with artificial sea water, mostly at 6°C and partly at 12°C. Crossing was carried out between these stocks immediately after collection and eggs were spawned within several days. Eggs became cysts, secreting a thin periderm on the bottom of the rearing vessel in each population within two weeks after crossing. The culture medium was frequently changed and subsequent development of the embryo was observed. Newly hatched hydroids began to appear on the bottom of the container three months after encystment at 6°C, two months after at 12°C, leaving the empty sheaths of the cysts, the outlines of which still remained clear.

All measurements were taken from living specimens except for some cysts which were empty due to hatching of the hydroid, and ranges are shown together with mean  $\pm$  SD and sample size in parentheses.

### Description of cyst and newly hatched hydroid

The cysts have a thin, chitinous sheath, a plano-convex shape, and a milky white color, and they measure 0.22–0.28 mm ( $0.24 \pm 0.02$  mm,  $N=7$ ) in diameter. One other cyst which was on top of another cyst was smaller, 0.18 mm in diameter.

The newly hatched hydroids are actinula-like in shape, and are 0.31–0.52 mm long ( $0.37 \pm 0.06$  mm,  $N=11$ ) and 0.20–0.25 mm ( $0.24 \pm 0.02$  mm,  $N=11$ ) in maximum width. The aboral tentacles are always more numerous and longer than the oral tentacles. There are 13–19 ( $15 \pm 2$ ,  $N=11$ ) aboral tentacles arranged in two whorls and 5–7 ( $6 \pm 1$ ,  $N=11$ ) oral tentacles in a circlet. Both kinds of tenta-

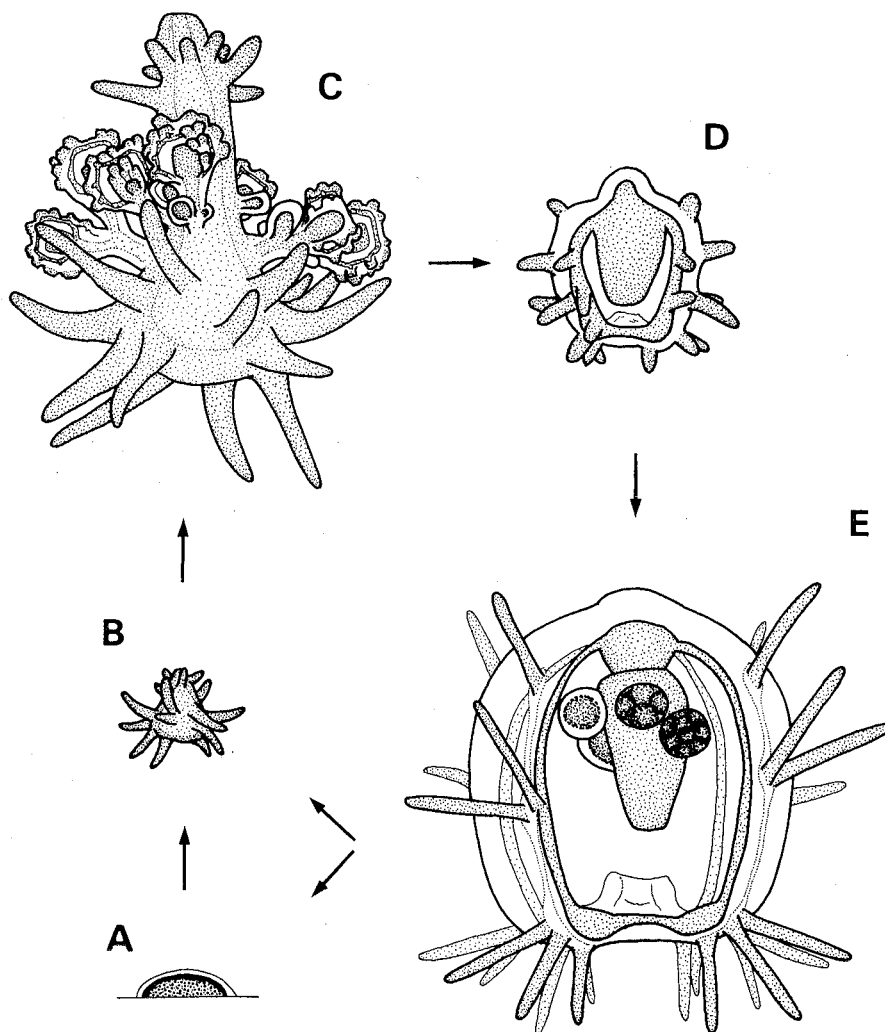


Fig. 1. Life history of *Climacocodon ikarii*. A: cyst. B: primary hydroid. C: well-developed hydroid with many medusa buds. D: newly liberated medusa. E: female mature medusa with cleaving eggs. B-E: redrawn from Kubota, 1979.

cles are filiform, and the aboral ones are up to 0.20 mm long and the oral ones up to 0.08 mm long.

*Remarks.* The present newly hatched hydroid is similar to the actinula-like hydroid that developed directly on the manubrium of a female medusa as described by Kubota (1979). Now the resting stage is known, and it is confirmed that the life history of *Climacocodon ikarii* (Fig. 1) is similar to that of *Margelopsis haeckeri* Hartlaub described by Werner (1955), though the latter develops parthenogenetically. Both the hydroid and medusa (female and male) of *C. ikarii* appeared only in the cold season in Japan (see Kubota, 1979), and this species may pass the remainder of the year in the form of cysts. *C. ikarii* is the third species so far known to form a dormant cyst in Japan besides *Hataia parva* and *Fukaurahydra anthoformis*. This is also another example of the prevalence of cyst formation in solitary hydroids living in cool or cold waters (see Yamada & Kubota, 1991).

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